

ON TWO HOLARCTIC PEMPHILIDINE WASPS
(HYMENOPTERA, SPHECIDAE).

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Several years ago I called attention to the fact that several of our common Nearctic wasps were identical with equally common European species.¹ Since then two interesting cases of a similar nature have come to my attention and are reported here. During the course of the past century and a half, each of these wasps has acquired a startling array of synonyms which are listed below along with the more recent bibliographic records of the species. For a complete bibliographic history of these species in Europe, Kohl's monograph of the Palaearctic *Crabrones* may be consulted.²

Ectemnius (*Ectemnius*) *dives* (Lepeletier et Brullé)

Solenius dives Lepeletier et Brullé, Ann. Soc. Ent. France, III, p. 716 (1835). [♂, ♀; Paris, France.]

Crabro alatulus Dahlbom, Exam. de Crabron. Scand., p. 85 (1840). [♂, ♀; Östergöthland, Sweden.]

? *Crabro pictipes* Herrich-Schaeffer, Faun. Insec. German. Fasc. 181, tab. 5 (1841).

Solenius 8-notatus Dahlbom, Hymen, Europ., I, p. 388 (1845). [♀; Habitat in Gallia.]

Crabro auratus F. Smith, Catal. Hymen. Brit. Mus., IV, p. 398 (1856). [New name for *Solenius dives* Lep. & Br.]

Crabro (*Ectemnius*) *pictus* Schenck, Jahrb. Ver. Naturk. Nassau, XII, p. 70 (1857). [♀.]

Crabro montanus Cresson, Proc. Ent. Soc. Phila., IV, p. 484 (1865). [Nec Gistl.] [♀; Mountain region, Colorado Territory; summer, 1864.]

Crabro cristatus Packard, Proc. Ent. Soc. Phila., VI, p. 101 (1866). [♂; Colorado Territory and Illinois.]

Crabro cubiceps Packard, Proc. Ent. Soc. Phila., VI, p. 105 (1866). [♀; Illinois; Brunswick, Maine, on *Spiraea alba*.]

Crabro montanus Fox, Trans. Amer. Ent. Soc., XXII, p. 139 (1895). [♀, ♂; Canada to N. Y.; Ill.; Mich.; S. Dak.; Colo.; Nev.; Ore.; Wash.]

¹ Bull. Brooklyn Ent. Soc., XXXVIII, pp. 14-16 (1943).

² Ann. k. k. Naturhist. Hofmus. Wien, XXIX, pp. 1-453 (1915).

- Crabro montanus* Kincaid, Ent. News, XI, p. 355 (1900).
[♀, ♂; Washington: various localities.]
- Crabro dives* Schencki Cockerell, The Entomologist, XL, p. 51
(1908). [New name for *Crabro pictus* Schenck, 1857
nec Fabricius, 1793.]
- Crabro (Ectemnius) montanus* Viereck, [in Smith] Ann.
Rept. New Jersey St. Mus., 1909, p. 681 (1910). [Prob-
ably in New Jersey.]
- Crabro (Crabro Ectemnius) dives* Kohl, Ann. k. k. Naturh.
Hofmus. Wien, XXIX, p. 94, 379 (1915). [♀, ♂;
complete synonymy, bibliographic history and range in
Palaeartic region.]
- Solenius (Ectemnius) montanus* Rohwer, Conn. Geol. & Nat.
Hist. Surv. Bull. 22, p. 666 (1916).
- Crabro montivagans* Strand, Arch. Naturg., LXXXII, p. 98
(1917). [New name for *Crabro montanus* Cresson *nec*
Gistl.]
- Solenius cristatus* Cockerell, Ent. News, XXX, p. 114 (1919).
[Correct name for *Crabro montanus* Cresson *nec* Gistl.]
- Cr[abro] (Ectemnius) dives* Berland, Faune de France, X,
p. 196 (1925). [♀, ♂; all of France; nests in holes in
the branches of trees; preys upon Diptera.]
- Crabro montanus* Carter, Canad. Entom., LVII, p. 131
(1925). [♂, ♀; Edmonton, Alberta.]
- Ectemnius montanus* Johnson, Biol. Surv. Mt. Desert Reg.,
Pt. I: Insect., p. 157 (1927). [Mt. Desert I., Maine.]
- Solenius (Solenius) montanus* Bradley, [in Leonard] Cornell
U. Agr. Expt. Sta. Mem. 101, p. 1019 (1928). [New
York: Ithaca reg.; nests in logs.]
- Crabro (Solenius) dives* Gussakovsky, Ark. Zool. (Stock-
holm), XXIV, no. 10, p. 16 (1932). [♀, ♂; Ussuri,
Manchuria: Sedanka. Sutshan.]
- Crabro (Ectemnius) dives* Nixon, Ent. Month. Mag., LXXI,
p. 57 (1935). [♂, ♀; Tulse Hill, s. e. London; nesting
in telegraph pole.]

The North American species which has hitherto been known as *Crabro montanus* Cresson (*nec* Gistl) or *C. cristatus* Packard is identical with the European *Ectemnius dives* (Lep. & Br.). Nearctic specimens of the species compared with European material determined by Kohl as *dives* agree in all essential respects. The species exhibits a certain amount of variation in livery and sculpturing, and in the spination of the male fore tarsi in both Europe

and North America, but none of these variations appear to be localized or of sufficient importance to warrant the division of the species at the present state of our knowledge into geographical races.

In North America *dives* is common and widespread from the Atlantic to the Pacific coasts in the Canadian provinces and the northern United States. I have seen specimens from Maine, Massachusetts, New York, New Jersey, Pennsylvania, Illinois, Ohio, Michigan, South Dakota, Colorado, Nevada, California, Oregon, Washington, British Columbia, Alberta, Ontario and Quebec. It has also been reported from Vermont, Connecticut and Wisconsin.

In the Palaearctic Region *dives* is equally common and widespread, ranging from Spain and the British Isles to the Amur region of eastern Siberia and the Ussuri in eastern Manchuria and from Algeria northward to Scandinavia. The common and widespread occurrence of this species throughout the United States and Canada, and particularly its presence in the mountain region of Colorado as early as 1864, coupled with the fact that it inhabits eastern Siberia, indicates that in all probability *dives* immigrated into North America via the Siberian-Alaskan land bridge in preglacial times, during some interglacial period, or at a postglacial optimum.

Despite its commonness in America, very little is known of the ethology of *dives*. Rau states³ that Barth found *dives* (recorded as *montanus* Cress.) nesting in an old log (probably in the vicinity of Milwaukee, Wisc.) in company with *Ectemnius obscurus*, *E. chrysargyrus*, and *E. sayi*. A similar paucity of information exists in Europe about the species. Kohl, in his monograph of the Palaearctic Crabrones, states⁴ that *dives* nests in decayed or rotten logs and also in the stems of hornbeam, roses and elders and the canes of *Ribes*; and that the adults frequent the flowers of common umbellifers. Sickmann⁵ has found that *dives* nests in old stems and provisions its cells with flies; while Nixon has recently recorded⁶ it as emerging from holes in a telegraph pole at Tulse Hill in southeastern London.

³ Rau: Wasp studies Afield, p. 96 (1918).

⁴ Kohl: Ann. k. k. Naturhist. Hofmus. Wien, XXIX, p. 379 (1915).

⁵ Sickmann: Jahrsber. Naturwiss. Ver. Osnabruck, IX, p. 58 (1893).

⁶ Nixon: Ent. Monthly Mag., LXXI, p. 57 (1935).

Ectemnius (*Metacrabo*) *4-cinctus* (Fabricius)

Crabro 4-cinctus Fabricius, Mantissa Insect., I, p. 295 (1787).

[Habitat Hafniae.]

Crabro cephalotes Olivier, Encycl. Méthod. Insect., VI, p. 513 (1791). [Environs de Paris.]

Crabro striatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 707 (1835). [♀, ♂; Environs de Paris.]

Crabro ornatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 709 (1835). [♀; Environs de Paris.]

Blepharipus striatulus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 737 (1835). [♂; Environs de Paris.]

Ceratocolus striatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 744 (1835). [♂; Environs de Paris.]

Ceratocolus fasciatus var. 1, Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 746 (1835). [♂; Environs de Bordeaux.]

Crabro Lindenius Shuckard, Essay Indig. Foss. Hymen., p. 143 (1837). [♀, ♂; England: London. Ripley in Surrey.]

Crabro Shuckardi Dahlbom, Exam. de Crabron. Scand., p. 98 (1840). [♂, ♀; Östergöthland, Sweden.]

Crabro interruptus Dahlbom, Hymen. Europ., I, p. 418 (1845). [♂, ♀; widespread throughout Europe.] [New name for *Crabro Shuckardi* Dahlbom, 1840.]

Crabro Fargei F. Smith, Catal. Hymen. Brit. Mus., IV, p. 410 (1856). [New name for *Ceratocolus striatus* Lepeletier & Brullé, 1835.]

? *Crabro frigidus* F. Smith, Catal. Hymen. Brit. Mus., IV, p. 419 (1856). [♀; North America.]

Crabro aciculatus Provancher, Natural. Canad., XIII, p. 108 (1882). [♀, ♂; Canada, Quebec: Cap Rouge and Chicoutimi.]

Crabro (Solenius) ruthenicus F. Morawitz, Hor. Soc. Ent. Ross., XXVI, p. 174 (1892). [♀; Ostachov in Tver, Russia.]

Crabro aciculatus Fox, Trans. Amer. Ent. Soc., XXII, p. 160 (1895). [♀; Canada; Illinois.]

Crabro (Crabro) quadricinctus Kohl, Ann. k. k. Naturhist. Hofmus. Wien, XXIX, pp. 42, 358 (1915). [♀, ♂; complete synonymy, range, and resumé of biology in Palaearctic region.]

Crabro aciculatus Gahan & Rohwer, Canad. Entom., XLIX, p. 391 (1917). ["Type.—Female, yellow label 813. 2 Coll.

Publ. Mus., Quebec. Male, allotype, without label."]

Metacrabro quadricinctus Spooner, Journ. Soc. Brit. Ent., I, pp. 48-53 (1934). [Biology of a colony: Dartmoor, near Plympton, S. Devon.]

Metacrabro quadricincta Richards, Proc. R. Ent. Soc. London, (B) Tax., V, p. 171 (1936). [Type of *4-cinctus* Fabricius = *zonatus* Panzer sensu Kohl, 1915.]

Solenius aciculatus Krombein, Bull. Brooklyn Ent. Soc., XXXIV, p. 143 (1939). [New York: various localities.]

The large and handsome Nearctic form *Crabro aciculatus* is relatively rare in collections and has been generally unrecognized ever since Provancher described it in 1882 from Lower Canada. Of late years the species has become rather common in the region about Ithaca, N. Y., and I have seen additional specimens of it from Illinois, Pennsylvania (Swarthmore), Connecticut (Cornwall), and various localities in Quebec (Joliette, Montreal, etc.). These specimens, however, agree perfectly with Kohl's description and figures of *Crabro quadricinctus* [Fabricius], as well as European material determined as such by him. Consequently, *Crabro aciculatus* Provancher, 1882 must be recorded as a synonym of *C. 4-cinctus* Fabricius, 1787 sensu Kohl, 1915. Richards has recently stated, upon the authority of Dr. K. L. Henriksen, that the presumed type of *C. 4-cinctus* F., in the Lund Collection at Copenhagen, is *C. zonatus* Panzer sensu Kohl (despite Kohl's denying it) and that another specimen labelled (by Fabricius or Lund) "Varietas" agrees with Kohl's interpretation of *C. 4-cinctus* F. In view of all the facts of the case, I am inclined to agree with Drs. Richards and Henriksen that some error, a switch of labels perhaps, has occurred in the past century and a half and advocate that the name *Crabro 4-cinctus* Fabricius sensu Kohl should continue to be applied to this species.

In Europe *4-cinctus* is a common and widespread form, ranging from England to southern and eastern Russia and from Sicily to as far north as the 61° of latitude in Scandinavia. In this hemisphere *4-cinctus* is apparently confined as yet to northeastern America, and I believe that, like *Ancistrocerus parietum* and other Aculeate Hymenoptera which nest in wood, *4-cinctus* is a relatively recent accidental introduction.

Although nothing has been recorded of the habits of *4-cinctus* in America, there are many accounts of its life-history in European literature. These data have been summarized by Kohl in his monograph of the Palaearctic *Crabrones*, and Hamm and Richards, and

Spooner have presented admirable accounts of its biology in Britain. These wasps generally nest in colonies: they construct their burrows in either firm or decayed oak trunks or posts and their excavations usually produce large piles of wood dust. The burrow consists of a main tunnel from which branch off small lateral galleries containing one or more cells in a linear series. The main tunnel of the nest is apparently communal, for both Spooner, and Hamm and Richards have observed numerous females entering the same nesting hole. Each female, however, probably excavates her own lateral galleries and provisions her own cells. Quite an assortment of Diptera of various families (Calliphoridae, Sarcophagidae, Anthomyiidae, Cordyluridae, Helomyzidae, Sapromyzidae, Syrphidae, Tabanidae and Leptidae) form the prey of *4-cinctus*, but in all likelihood each female provisions any one cell with only one or perhaps a few species of flies.

Rabbitbrush Aphid Notes.—An accidental alate *Amphorophora sonchi* Oest. was taken on *Chrysothamnus nauseosus* at Wells, Nevada, Aug. 20, 1943. *Aphis chrysothamni* Wilson was collected from *Chrysothamnus nauseosus* at Helena, Montana, Aug. 3; Bend, Sisters and Tumalo, Oregon, Aug. 24, 1944; Twin Falls, Idaho, August 13, 1943; Wells, Nevada, August 20, 1943; Richmond and Lewiston, Utah, Sept. 8, 1938. *Aphis gregalis* Knlt., on *C. vaseyi* at Widtsoe, Utah, Sept. 19, 1935; on *C. viscidiflorus* var. *typicus*, Granite, Utah, June 6, 1931; *C. viscidiflorus* at Hubbard Ranch and Snowwater Lake, Nevada, Aug. 20, 1943; also taken at Rexburg and Riverdale, Idaho (C. F. Smith). A *Capitophorus gregarius* Knlt. on *C. nauseosus* in Logan Canyon, Utah, Oct. 8, was being fed on by a 2-spotted lady-bird beetle; this aphid was also collected at Mt. Nebo, Utah, July 12, 1942. *Capitophorus oestlundii* Knlt. collected on *Chrysothamnus nauseosus* at Ft. George Wright, Washington, August 9, Berns, Oregon, August 24, and Helena, Montana, August 3, 1944. *Macrosiphum escalantii* (Knlt.) on *Chrysothamnus viscidiflorus*, Sisters, Oregon, Aug. 24, 1944; on *C. nauseosus* at Wells, Nevada, Aug. 20, 1943; Alpine, Wyoming, Sept. 11, 1941. *Durocapillata utahensis* Knlt. on *C. viscidiflorus* at Snowwater Lake, Nevada, August 20, 1943.—G. F. KNOWLTON, Utah Agricultural Experiment Station, Logan, Utah.